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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q68233

Akihiro SHIMOMURA, et al.

Appln. No. 10/054,864

Group Art Unit: 1752

Confirmation No.: 8108

Examiner: Not yet assigned

Filed: January 25, 2002

For: MULTI-COLOR IMAGE-FORMING MATERIAL AND MULTI-COLOR IMAGE-FORMING PROCESS

RECEIVED  
JUN 24 2002  
TC 1700

INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 and 1.98

Commissioner for Patents  
Washington, D.C. 20231

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Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 A & B (modified) (substitute for PTO Form 1449) form and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

One copy of each of the listed documents is submitted herewith.

The present Information Disclosure Statement is being filed: (1) No later than three months from the application's filing date for an application other than a continued prosecution application (CPA) under §1.53(d); (2) Before the mailing date of the first Office Action on the merits (whichever is later); or (3) Before the mailing date of the first Office Action after filing a

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request for continued examination (RCE) under §1.114, and therefore, no Statement under 37 C.F.R. § 1.97(e) or fee under 37 C.F.R. § 1.17(p) is required.

In compliance with the concise explanation requirement under 37 C.F.R. § 1.98(a)(3) for foreign language documents, Applicant submits the following explanations:

Japanese Patent Application (Laid-Open) No. 122280/1994 discloses an image-forming material wherein an image-receiving sheet having an image-receiving layer and a heat-transfer sheet having a light-heat conversion layer and an image-forming layer on a support, the image-forming layer of the heat-transfer sheet is superposed on the image-receiving layer of the above-described image-receiving sheet, and by irradiating by a laser light, the laser light irradiated region of the image-forming layer is transferred onto the image-receiving layer of the image-receiving sheet to record images, color proofs of yellow, magenta, and cyan are described, in the layer thickness of the image-forming layers, the heat-transfer sheet of magenta and cyan is described, the layer thickness of the image-forming layers is  $C = 0.5 \mu\text{m}$  [0103] and  $M = 0.4 \mu\text{m}$  [0115], the transfer line width of from 6 to 11 (Example), and from 2 to 3 (Comparative Example) [0124] are described, but there is no description about a multicolor image-forming material characterized in that the layer thickness of image-forming layers of a heat-transfer sheet having different four kinds of colors is from 0.01 to  $1.5 \mu\text{m}$ , the two-dimensional energy distributions of a laser beams spot are integrated to the main scanning direction, and to the half width at half maximum of the energy distribution in the side scanning direction, the line width of the image laser transferred is from 0.8 to 2.0 times.

Japanese Patent Application (Laid-Open) No. 115265/1994

This patent application relates to light-heat conversion type recording of obtaining ink images by facing the ink surface of a light-heat conversion type heat-mode recording material to the image-receiving light-heat conversion type heat-mode image-receiving material, and imagewise irradiating a light, the light-heat conversion type heat-mode recording material, characterized in that the above-described light-heat conversion type heat-mode recording material has at least a support, a cushion layer, and an ink layer, and said cushion layer is constituted of at least two layers.

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This document further discloses an image-forming material wherein using an image-receiving sheet having an image-receiving layer and a heat-transfer sheet having a light-heat conversion layer and an image-forming layer on a support, the image-forming layer of the heat-transfer sheet is superposed on the image-receiving layer of the above-described image-receiving sheet, and by irradiating by a laser light, the laser light irradiated region of the image-forming layer is transferred onto the image-receiving layer of the image-receiving sheet to record images, and it is described [0038] that there is no unevenness of line width at a sensitivity of  $200 \text{ mJ/cm}^2$ . However, there is no description about a multicolor image-forming material characterized in that the layer thickness of image-forming layers of a heat-transfer sheet having different four kinds of colors is from  $0.01$  to  $1.5 \text{ }\mu\text{m}$ , the two-dimensional energy distributions of a laser beams spot are integrated to the main scanning direction, and to the half width at half maximum of the energy distribution in the side scanning direction, the line width of the image laser transferred is from  $0.8$  to  $2.0$  times.

Japanese Patent Application (Laid-Open) No. 112970/1996 (FF) discloses an image-forming material wherein an image-receiving sheet having an image-receiving layer and a heat-transfer sheet having a light-heat conversion layer and an image forming layer on a support, the image-forming layer of the heat-transfer sheet is superposed on the image-receiving layer of the above-described image-receiving sheet, and by irradiating by a laser light, the laser light irradiated region of the image-forming layer is transferred onto the image-receiving layer of the image-receiving sheet to record images, color proofs of yellow, magenta, and cyan are described, in the layer thickness of the image-forming layers,  $C = 0.36 \text{ }\mu\text{m}$ ,  $M = 0.38 \text{ }\mu\text{m}$ , and  $Y = 0.42 \text{ }\mu\text{m}$ ,

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and a problem the image density reproducibility of fine lines, etc., is inferior is proposed [0004], but there is no description about a multicolor image-forming material characterized in that the layer thickness of image-forming layers of a heat-transfer sheet having different four kinds of colors is from 0.01 to 1.5  $\mu\text{m}$ , the two-dimensional energy distributions of a laser beams spot are integrated to the main scanning direction, and to the half width at half maximum of the energy distribution in the side scanning direction, the line width of the image laser transferred is from 0.8 to 2.0 times. This patent application also relates to a recording material having formed on a support a heat-sensitive ink layer containing a coloring agent, characterized in that the melting point or the softening point of the heat-sensitive ink is in the range of from 50 to 150°C, and the viscosity is in the range of from  $10^5$  to  $10^8$  cp.

Japanese Patent Application (Laid-Open) No. 11646/1997 (FF) discloses an image-forming material wherein an image-receiving sheet having an image-receiving layer and a heat-transfer sheet having a light-heat conversion layer and an image-forming layer on a support, the image-forming layer of the heat-transfer sheet is superposed on the image-receiving layer of the above-described image-receiving sheet, and by irradiating by a laser light, the laser light irradiated region of the image-forming layer is transferred onto the image-receiving layer of the image-receiving sheet to record images, and it is described that the images formed are 4 colors [0046], the system is a laser heat transfer, the layer thickness of image-forming layers is from 0.1 to 1.5  $\mu\text{m}$  [0037], and the laser recording faculty, the recorded line width is from 4.8 to 5.6 mm, but there are no descriptions about a multicolor image-forming material characterized in that, the two-dimensional energy distributions of a laser beams spot are integrated to the main scanning

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direction, and to the half width at half maximum of the energy distribution in the side scanning direction, the line width of the image laser transferred is from 0.8 to 2.0 times. This patent application also relates to a heat-transfer sheet having formed on a support a light-heat conversion layer and an image-forming layer containing a thermoplastic resin and a coloring agent in the order, characterized in that the light-heat conversion layer is obtained by coating a coating liquid containing a light-heat conversion substance and polyamide acid followed by drying.

Japanese Patent Application (Laid-Open) No. 71634/2000 (Konica) discloses an image-forming material wherein an image-receiving sheet having an image-receiving layer and a heat-transfer sheet having a light-heat conversion layer and an image-forming layer on a support, the image-forming layer of the heat-transfer sheet is superposed on the image-receiving layer of the above-described image-receiving sheet, and by irradiating by a laser light, the laser light irradiated region of the image-forming layer is transferred onto the image-receiving layer of the image-receiving sheet to record images, but it is not disclosed that a multicolor image-forming material characterized in that the heat-transfer comprises a yellow color heat-transfer sheet wherein the maximum absorbance ( $\lambda$  max) of the spectral distribution is in the region of from 380 to 460 nm, a magenta color heat-transfer sheet wherein the maximum absorbance ( $\lambda$  max) of the spectral distribution is in the region of from 540 to 600 nm, a cyan color heat-transfer sheet wherein the maximum absorbance ( $\lambda$  max) of the spectral distribution is in the region of from 610 to 730 nm, and a black color heat-transfer sheet is particularly preferred. Furthermore, the present invention is characterized in that the recording area is the size of at least 515 mm x 728

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mm, but it is only disclosed that the area is A2 size [0136, 0138, 0140, 142, 0144]. This patent application also relates to an image-forming method using an intermediate transfer medium, successively having a step of carrying out an image formation on the intermediate transfer medium to a final image carrier, characterized in that a transfer apparatus having a pair of heat lamirolls and the diameter of each lamiroll is from 50 to 350 mm.

Japanese Patent Application (Laid-Open) No. 351279/2000 (FF) discloses a multilayer image-forming material wherein an image-receiving sheet having an image-receiving layer and a heat-transfer sheet and a heat-transfer sheet having a light-heat conversion layer and image-forming layers on a support and having different colors of yellow of Pigment Yellow 14, magenta of Pigment Red 57: 1, and cyan of Pigment Blue 15, the image-forming layer of each heat-transfer sheet is superposed of the above-described image-receiving sheet, a laser light is irradiated, and the laser light irradiated region of the image-forming layer is transferred onto the image-receiving sheet to record images, but it is not disclosed that the heat-transfer comprises a yellow color heat-transfer sheet wherein the maximum absorbance ( $\lambda$  max) of the spectral distribution is in the region of from 540 to 600 nm, a cyan color heat-transfer sheet wherein the maximum absorbance ( $\lambda$  max) of the spectral distribution is in the region of from 610 to 730 nm, and a black color heat-transfer sheet is particularly preferred. Furthermore, the present invention is characterized in that the recording area of the above-described multicolor image is the size of at least 515 mm x 728 mm, but it is disclosed that the heat-transfer sheet is only a heat-transfer sheet (30 cm x 40 cm) [0012]. This patent application also relates to a heat transfer sheet having formed on a support a light-heat conversion layer and an image-forming layer, characterized in

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that the center-line average roughness Ra of the surface of the light-heat conversion layer after recording at any energy of 220 mJ/cm<sup>2</sup> is not larger than 3 μm.

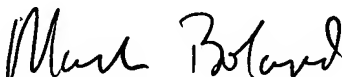
Japanese Patent Application (Laid-Open) No. 118144/2000 (Konica) discloses a multicolor image-forming material wherein using an image-receiving sheet having an image-receiving layer and a heat-transfer sheet having a color-heat conversion layer and an image-forming layer on a support and having different colors of yellow of C.I. 21090 (corresponding to Pigment Yellow), magenta of C.I. 15850 (corresponding to Pigment Red 57: 1), and cyan of C.I. 74160 (corresponding to Pigment Blue), the image-forming layer of each heat-transfer sheet is superposed of the above-described light irradiated region of the image-forming layer is transferred onto the image-receiving sheet to record images, but it is not disclosed that the heat-transfer sheets having a at least four kinds of colors, and that a multicolor image-forming material characterized in that the heat-transfer comprises a yellow color heat-transfer sheet wherein the maximum absorbance ( $\check{y}$  max) of the spectral distribution is in the region of from 380 to 460 nm, a magenta color heat-transfer sheet wherein the maximum absorbance ( $\check{y}$  max) of the spectral distribution is in the region of from 610 to 730 nm, and a black color heat-transfer sheet is particularly preferred. Furthermore, the present invention is characterized in that the recording area of the above-described multilayer image is the size of at least 515 m. This patent application also relates to a laser heat transfer image-forming method using an ink sheet wound in a roll form with the ink surface at the outside and an image-receiving sheet wound in a roll form with the image-receiving surface at the outside, in a state of cutting both the sheets in definite lengths, respectively, and laminating and holding them on a drum-form support,

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irradiating a laser light corresponding to an image information, absorbing the laser light by the ink sheet and converting the light into heat, and transferring and forming the image on the image-receiving surface by the converted heat, characterized in that the thickness of the ink layer of the above-described ink sheet is from 0.2 to 0.6  $\mu\text{m}$ .

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant does not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

Respectfully submitted,

  
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SSubstitute for Form 1449 A &amp; B/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Complete if Known

Application Number	10/054,864
Confirmation Number	3926
Filing Date	January 25, 2002
First Named Inventor	Akihiro SHIMOMURA
Art Unit	1752
Examiner Name	Not yet assigned
Attorney Docket Number	Q68233

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of

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**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
		US 5,053,381		10/1/91	Chapman et al.
		US 5,126,760		6/30/92	DeBoer
		US 5,300,398		4/5/94	Kaszczuk
		US 5,512,931		4/30/96	Nakajima et al.
		US 5,580,693		12/3/96	Nakajima et al.
		US 5,593,808		1/14/97	Ellis
		US 5,611,881		3/18/97	Kimura et al.
		US 6,027,850		2/22/00	Kawakami et al.

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
		JP	6-122280	A	5/6/94		No
		JP	8-112970	A	5/7/96		No
		JP	2000-71634	A	3/7/00		No
		JP	9-11646	A	1/14/97		No
		JP	2000-351279	A	12/19/00		No
		JP	118144	A	4/25/00		No
		JP	6-115265	A	4/26/94		No

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>

Examiner Signature

Date Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or in the comment box of this document. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to indicate here if English language Translation is attached.